

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Board of Patent Appeals and Interferences

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In re application of:	Williams, et al.)
Serial No:	09/768,975) Art Unit
Filed:	January 23, 2001) 2653
For:	A DUAL STAGE, HEAD STACK ASSEMBLY FOR A DISK DRIVE)
Examiner:	Blouin, Mark)
Attorney Docket:	STL6943.00)

REVISED BRIEF ON APPEAL

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This revised Brief on Appeal is filed in response to a Notification of Non-Compliant Appeal Brief that was mailed on February 8, 2007. This revised Brief on Appeal is being timely filed within the one-month deadline for response, and should therefore be considered by the Board.

i. Real Party in Interest

The real party in interest is Maxtor Corporation, assignee of the present application.

II. Related Appeals and Interferences

There are no appeals or interferences that are known which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending Appeal.

III. Status of Claims

Claims 6, 9-11, 13 and 22-75 are pending in the present application. Claims 1-5, 7-8, 12 and 14-21 have previously been canceled without prejudice. Claims 6, 9-11, 13 and 22-75 are the subject of this appeal.

IV. Status of Amendments

No amendments to the claims have been filed subsequent to final rejection.

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V. Summary of Claimed Subject Matter

Regarding claim 6, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, one embodiment of the present invention may be summarized as a head stack assembly 15 for a disk drive 10 having a storage disk 32. The head stack assembly 15 comprises an actuator arm 18, a coarse positioner 22 that moves the actuator arm 18 relative to the storage disk 32, a transducer assembly 20 including a load beam 50, a flexure 52 secured to the load beam 50 and a data transducer 54 secured to the flexure 52. A separately formed base plate 26 secures the transducer assembly 20 to the actuator arm 18. The base plate 26 includes one or more edges and a pair of flex sections 86 that cantilever away from at least one of the edges. The flex sections 86 allow the base plate 26 to flex, and a pair of spaced apart positioner cavities 85 are positioned between the flex sections 86. A fine positioner 24 is secured to the base plate 26 and positioned in the positioner cavities 85. The fine positioner 24 moves a portion of the base plate 26 relative to the actuator arm 18.

Regarding claim 22, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a disk drive 10 comprising an actuator arm 18, a transducer assembly 22 including a load beam 50 and a data transducer 54 coupled to the load beam 50. A separately formed base plate 26 secures the transducer assembly 22 to the actuator arm 18, and includes a flex section 86 that

allows the base plate 26 to flex. A fine positioner 24 is secured to the base plate 26 so that the fine positioner 24 does not contact the flex section 86, and the fine positioner 24 selectively flexes at least a portion of the base plate 26.

Regarding claim 37, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a disk drive 10 comprising an actuator arm 18, a transducer assembly 22 including a load beam 50 and a data transducer 54 coupled to the load beam 50. A separately formed base plate 26 secures the transducer assembly 22 to the actuator arm 18. A first piezoelectric motor 24 has proximal and distal ends secured to the base plate 26 so that the first piezoelectric motor 24 is under compression and moves a portion of the base plate 26 relative to the actuator arm 18.

Regarding claim 50, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a disk drive 10 comprising an actuator arm 18, a transducer assembly 22 including a load beam 50 and a data transducer 54 coupled to the load beam 50. A separately formed base plate 26 secures the transducer assembly 22 to the actuator arm 18, and includes a plate mount 80 that secures the base plate 26 to the actuator arm 18. A pair of piezoelectric motors 24 are each secured to the base plate 26 between the plate mount 80 and the data transducer

54. The piezoelectric motors 24 are substantially parallel to each other and move a portion of the base plate 26 relative to the actuator arm 18.

Regarding claim 59, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a disk drive 10 comprising an actuator arm 18, a transducer assembly 22 including a load beam 50 and a data transducer 54 coupled to the load beam 50. A separately formed base plate 26 secures the transducer assembly 22 to the actuator arm 18, and includes a positioner cavity 85 that extends through the base plate 18. A fine positioner 24 is secured to the base plate 26 so that the fine positioner 24 is positioned over at least a portion of the positioner cavity 85, and the fine positioner 24 selectively flexes at least a portion of the base plate 26.

Regarding claim 67, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a method for increasing the positioning accuracy of a disk drive 10, the method comprising the steps of (1) securing a transducer assembly 22 to an actuator arm 18 with a separately formed base plate 26 having a flex section 86 that flexes; (2) securing a fine positioner 24 to the base plate 26 so that the fine positioner 24 is not in contact with the flex section 86; and (3) flexing the flex section 86 with the fine positioner 24 to cause at least a portion of the base plate 26 to move relative to the actuator arm 18.

Regarding claim 75, as described in the specification at page 9, line 1 through page 1, line 33 and depicted in Figs. 1, 3A-3C and 4A-4C, another embodiment of the present invention may be summarized as a disk drive 10 comprising an actuator arm 18, a data transducer 54, a load beam 50 having a thickness and that is coupled to and supports the data transducer 54, and a base plate 26 that secures the load beam 50 to the actuator arm 18. The base plate 26 has a thickness that is at least approximately three times the thickness of the load beam 50, and includes a flex section 86 that allows the base plate 26 to flex. A fine positioner 24 is secured to the base plate 26 so that the fine positioner 24 does not contact the flex section 86, and the fine positioner 24 selectively flexes at least a portion of the base plate 26.

VI. Grounds of Rejection to be Reviewed on Appeal:

1. Whether claims 6, 9-11, 13 and 22-74 are anticipated by Khan et al. under 35 U.S.C. §102(e).

2. Whether claim 75 is unpatentable over Khan et al. under 35 U.S.C. §103(a).

VII. Argument:

Issue 1: Whether claims 6, 9-11, 13 and 22-74 are anticipated by Khan et al. under 35 U.S.C. §102(e).

Claims 6, 9-11, 13 and 22-74 are rejected under 35 U.S.C. § 102(e) as being anticipated by Khan et al. (US 6,188,548). The Appellants respectfully submit that Khan et al. does not support a rejection of these claims because Khan et al. does not teach or suggest the features of claims 6, 9-11, 13 and 22-74, as provided below.

The Examiner asserts in his Final Rejection that "...Khan et al. shows (Figs 1-5) a head stack assembly for a disc drive including ... a transducer assembly including a load beam (10), a flexure (12) secured to the load beam, a data transducer (40) secured to the flexure (12), a separately formed base plate securing the transducer assembly to the actuator arm, and a fine positioner (piezoelectric elements) secured directly to the base plate, the fine positioner moving a portion of the base plate relative to the actuator arm, wherein the base plate further comprises a positioner cavity (23) that receives the fine positioner, the proximal and distal ends are secured under compression, a flex section (224, 226) positioned adjacent to the positioner cavity, the flex section allowing the base plate to flex, a pair of spaced apart positioner cavities (Fig. 1) that receive the fine positioner, a pair of flex sections that allow the base plate to flex" The Appellants respectfully submit that this reading of Khan et al. is inaccurate.

Khan et al. is directed toward a disk drive suspension that includes a load beam 10 that is supported by a mount plate 14 having a boss 16. (Col. 5, lines 11-14). The load

beam 10 includes a base portion 18, a spring portion 20 and a beam portion 22 that carries a slider 40. (Col. 5, lines 14-16; Figs. 1-3 and 5). The Appellants submit that the mount plate 14, and more particularly the mount plate boss 16, fixes the base portion 18 of the load beam 10 to the actuator arm (not shown). Importantly, the mount plate boss 16 is not part of the load beam 10, but is part of the mount plate 14, which is a separate structure from the load beam 10, having a separate function within the disk drive. (See, for example, Figures 3-4).

Piezoelectric crystals 32, 34 are bonded to the base portion 18 and the beam portion 22 of the load beam 10. (Col. 5, lines 17-20; Figs. 1-5). Moreover, the spring portion 20 of the load beam 10 includes arcuate sections 36, 38 that are connected to the base portion 18 of the load beam 10 and the beam portion 22 of the load beam 10. (Col. 5, lines 31-42; Figs. 1-5).

Khan et al. does not teach or suggest a separately formed base plate that secures the load beam structure to the actuator arm, with the base plate including one or more flex sections. Further, Khan et al. does not teach or suggest securing a fine positioner (e.g. one or more piezoelectric crystals 32, 34) to such a separately formed base plate.

With the present invention, the positioning of the fine positioner on the base plate, as opposed to the load beam, is beneficial for numerous reasons. Because the fine positioner is secured to the base plate instead of the load beam, the fine positioner is subject to less severe bending than if the fine positioner were secured to the load beam because of the relative thicknesses of the base plate versus the load beam. As a result thereof, more engineering changes to the design of the head stack assembly would be required if the fine positioner were added directly to the load beam.

Additionally, the location of the fine positioner less distally along the head-arm assembly decreases the likelihood of adverse resonance characteristics of the head stack assembly. Moreover, the less distal location of the fine positioner can decrease head gram load loss depending upon the gravitational orientation of the head-arm assembly relative to the storage disk. Further, the fine positioner of the present invention is placed in compression mode instead of a sheer mode as taught by Khan et al. In the compression mode, the fine positioner is more resilient to shock loads and vibration. This decreases the incidence of fine positioner stress cracking and increases the reliability of the fine positioner.

In addition, because of the placement of the fine positioner on the base plate rather than the load beam, the life of the fine positioner is increased. The thickness of the base plate is typically three to five times greater than the load beam. As a result of this design, the base plate is less flexible when compared to the load beam and the fine positioner is therefore somewhat more protected from shock and vibration.

Claims 6, 9-11 and 13:

In contrast to Khan et al., claim 6 requires a "head stack assembly ... comprising: an actuator arm; a coarse positioner that moves the actuator arm relative to the storage disk; a transducer assembly including a load beam, a flexure secured to the load beam, and a data transducer secured to the flexure; a separately formed base plate securing the transducer assembly to the actuator arm, the base plate including (i) one or more edges, (ii) a pair of flex sections that cantilever away from at least one of the edges, the flex sections allowing the base plate to flex, and (iii) a pair of spaced apart positioner cavities that are positioned between the flex sections; and a fine positioner secured to the base

plate, the fine positioner being positioned in the positioner cavities, the fine positioner moving a portion of the base plate relative to the actuator arm." As provided above, these features are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 6 under 35 U.S.C. § 102(e). Because claims 9-11 and 13 depend directly or indirectly from claim 6, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claims 22-26, 30-31, 33 and 35-36:

Claim 22 of the present application is directed to a disk drive that requires "an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a flex section that allows the base plate to flex; and a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate." These features are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 22. Because claims 23-36 depend directly or indirectly from claim 22, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claim 27:

Additionally, many of these dependent claims include additional features that are separately patentable in view of the cited reference. For example, dependent claim 27 requires that the fine positioner includes a pair of piezoelectric motors, and the base plate

includes a pair of flex sections that are each positioned substantially between the pair of piezoelectric motors. Khan et al. does not teach positioning two flex sections between the two piezoelectric motors. Therefore, the features of claim 27 are not taught or suggested by Khan et al.

Claims 28-29:

Moreover, dependent claims 28-29 require that the fine positioner includes a pair of piezoelectric motors, and that one (claim 28) or both (claim 29) of the piezoelectric motors is secured to the base plate under compression. Khan et al. does not discuss placement of the piezoelectric crystals under compression. Thus, the features of claims 28-29 are not taught or suggested by Khan et al.

Claims 32 and 51:

Further, dependent claim 32 (and dependent claim 51, see *infra*.) requires that the fine positioner includes a pair of piezoelectric motors, and that at least one of the piezoelectric motors includes a proximal and a distal end, and wherein the proximal end and the distal ends are the only portions of the piezoelectric motor that contact the base plate. Khan et al. does not teach contact between the piezoelectric crystals and the base plate, much less contact between the piezoelectric crystals and the base plate occurring only at the ends of the piezoelectric crystals. Thus, the features of claim 32 (and claim 51) are not taught or suggested by Khan et al.

Claim 34:

In addition, dependent claim 34 requires that the flex section is substantially V-shaped. Khan et al. does not teach the base plate having a flex section with this configuration. Therefore, the features of claim 34 are not taught or suggested by Khan et al.

Claims 37 and 46:

Claim 37 requires "an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm; and a first piezoelectric motor having a proximal end and a distal end, that ends being secured to the base plate so that the first piezoelectric motor is under compression, the first piezoelectric motor moving a portion of the base plate relative to the actuator arm." These features are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 37. Because claims 38-49 depend directly or indirectly from claim 37, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claim 38:

Additionally, many of these dependent claims include additional features that are separately patentable in view of the cited reference. For example, dependent claim 38 requires the disk drive to include a controller that directs current to the first piezoelectric motor, and wherein the first piezoelectric motor is under compression while the controller

is not directing current to the first piezoelectric motor. Khan et al. does not teach the piezoelectric crystal being under compression while no current is directed to the piezoelectric crystal. Therefore, the features of claim 38 are not taught or suggested by Khan et al.

Claims 39-45:

Dependent claims 39-45 also include features that are separately patentable over the cited reference. These claims require that the proximal end and the distal end of the first piezoelectric motor are the only portions of the first piezoelectric motor that contact the base plate. Khan et al. teaches that other portions of the piezoelectric crystals are in contact with the load beam, and that no portions of the piezoelectric crystals are in contact with the base plate. Thus, the features of claims 39-45 are not taught or suggested by Khan et al., and the rejection based on Khan et al. is unsupported and should be overturned.

Claim 47:

Dependent claim 47 also includes features that are separately patentable over Khan et al. Claim 47 requires, in combination with the features of claim 37, that the flex section of the base plate is substantially V-shaped. Khan et al. does not teach the base plate having a flex section with this configuration. Therefore, the features of claim 47 are not taught or suggested by Khan et al., and the rejection of this claim should be overturned.

Claims 50 and 53-57:

Claim 50 is directed toward a disk drive that requires "an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a plate mount that secures the base plate to the actuator arm; and a pair of piezoelectric motors that are each secured to the base plate between the plate mount and the data transducer, the piezoelectric motors being substantially parallel to each other, the piezoelectric motors moving a portion of the base plate relative to the actuator arm." As provided above, these features are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 50. Because claims 51-58 depend directly or indirectly from claim 50, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claim 52:

Additionally, many of these dependent claims include additional features that are separately patentable in view of the cited reference. For example, dependent claim 52 requires that the ends of at least one the piezoelectric motors is secured to the base plate so that the piezoelectric element is under compression. Khan et al. does not discuss placement of the piezoelectric crystals under compression. Thus, the features of claim 52 are not taught or suggested by Khan et al.

Claim 58:

Further, dependent claim 58 also includes features that are separately patentable over Khan et al. Claim 58 requires that at least one of the flex sections of the base plate is substantially V-shaped. Khan et al. does not teach the base plate having a flex section with this configuration. Therefore, the features of claim 58 are not taught or suggested by Khan et al., and the rejection of this claim should be overturned.

Claims 59-63:

Claim 59 requires "an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a positioner cavity that extends through the base plate; and a fine positioner that is secured to the base plate so that the fine positioner is positioned over at least a portion of the positioner cavity, the fine positioner selectively flexing at least a portion of the base plate." These features are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 59. Because claims 60-66 depend directly or indirectly from claim 59, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claim 64:

Additionally, many of these dependent claims include additional features that are separately patentable in view of the cited reference. For example, dependent claim 64 requires that each of the flex sections of the base plate is positioned substantially between the pair of piezoelectric motors. Khan et al. does not teach positioning two flex sections

between the two piezoelectric motors. Therefore, the features of claim 64 are not taught or suggested by Khan et al.

Claims 65-66:

Dependent claims 65-66 require that the fine positioner includes a pair of piezoelectric motors, and that one (claim 65) or both (claim 66) of the piezoelectric motors is secured to the base plate under compression. Khan et al. does not discuss placement of the piezoelectric crystals under compression. Thus, the features of claims 65-66 are not taught or suggested by Khan et al.

Claims 67-71 and 74:

Claim 67 of the present invention is directed toward a method that requires "securing a transducer assembly to an actuator arm with a separately formed base plate having a flex section that flexes; securing a fine positioner to the base plate so that the fine positioner is not in contact with the flex section; and flexing the flex section with the fine positioner to cause at least a portion of the base plate to move relative to the actuator arm." These steps are not taught or suggested by Khan et al. Therefore, Khan et al. does not support a rejection of claim 67. Because claims 68-74 depend directly or indirectly from claim 67, Khan et al. likewise does not support a rejection of these claims, and the rejection should therefore be overturned.

Claim 72:

Additionally, many of these dependent claims include additional features that are separately patentable in view of the cited reference. For example, dependent claim 72 requires positioning a pair of flex sections substantially between the piezoelectric motors, which is not taught or suggested by Khan et al.

Claim 73:

Further, dependent claim 73 requires securing the fine positioner to the base plate so that the fine positioner is under compression. This feature is also not taught or suggested by Khan et al.

Issue No. 2: *Whether claim 75 is unpatentable over Khan et al. under 35 U.S.C. §103(a).*

Claim 75 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Khan et al. in view of Ohwe et al (US 6,594,116). The Appellants respectfully appeal the rejection of claim 75 on the grounds that the cited combination of references does not support such a rejection, the cited combination does not teach or suggest the features of the rejected claim, and there is no motivation to combine the cited references.

The Examiner states in its rejection that "Khan et al shows all the features described, supra, but does not show a load beam where the base plate [sic], which is at least approximately three times the thickness of the lead beam. Ohwe shows ... that a load beam can be a thickness ranging between 0.02 to 0.08 mm, which when combined

with Khan et al. would make the base plate at least approximately three times the thickness of the load beam."

The Appellants respectfully disagree with this rationale for several reasons. First, even if Ohwe shows that a load beam has a thickness ranging between 0.02 to 0.08 mm, Khan et al does not teach or suggest use of a base plate, nor does Khan et al indicate what the thickness of a base plate would or should be. Thus, the combination does not teach or suggest having a base plate that is at least approximately three times the thickness of the load beam.

Second, the Examiner identifies in his Final Rejection what he believes is the "separately formed base plate" 18 in Khan et al. However, base portion 18 in Khan has a thickness that does not appear any different, i.e. thicker or thinner, than the remainder of the load beam 10. In reality, Appellants submit that base portion 18 is part of the load beam 10, and is not a separate structure that has a function of securing the load beam to the actuator arm. This is supported by a clear reading of Khan et al, which states that "load beam 10 has a base portion 18, fixed on mount plate boss 16, a spring portion 20 and a beam portion 22 carrying a slider 40." (Col. 5, lines 14-17).

However, assuming for the sake of argument that the base portion 18 is a "base plate" (which Appellants vehemently dispute), the thickness of the base portion 18 is the same as the thickness of the load beam 10. Combining the structure taught by Khan et al with the load beam disclosed in Ohwe et al, would not provide a ratio of the thickness of the base plate relative to the load beam as the Examiner suggests. Thus, the cited combination does not teach or suggest having a base plate that is at least approximately three times the thickness of the load beam.

Third, the Appellants submit that there is no motivation to use the device taught by Ohwe et al in Khan et al's device. "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the Appellant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991; Emphasis added). In the present case, neither is found.

Even if the combination of references taught every element of the claimed invention (which it does not), without a motivation to combine, a rejection based on a prima facie case of obviousness has been held improper. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). Further, the "mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990; emphasis original and added).

In the present case, the prior art does not clearly suggest the desirability of the resultant combination. In addition to the description of Khan et al. provided above, including the distinguishing feature that the piezoelectric crystals in Khan et al. are positioned on the load beam instead of a separately formed base plate, the Appellants submit that Khan et al. does not teach or suggest positioning one or more piezoelectric crystals on a base plate having a thickness that is at least three times the thickness of the load beam.

Additionally, regardless of the thickness of the base plate taught by Ohwe et al., neither Khan et al. nor Ohwe et al. teaches placement of the piezoelectric crystals on the base plate. In fact, Ohwe et al. does not teach or suggest using piezoelectric crystals, or any fine positioner, anywhere in the entire apparatus. Thus, combining Khan et al. and

Ohwe et al. (assuming there was some suggestion to do so, which Appellants dispute) still does not teach or suggest the features of the rejected claim.

Moreover, there does not appear to be any motivation to use to the load beam taught by Ohwe et al with the base portion 18 (which is actually part of the load beam 10) taught by Khan et al. The Appellants submit that there is no clear purpose to combining two load beams. On the other hand, assuming the Examiner's position is that the load beam 1 in Ohwe et al should be combined with the mount plate 14 taught by Khan et al, the Appellants submit that the mount plate 14 is a separate structure from the load beam 10, and that no piezoelectric crystals are secured to this separate structure 14, in direct contrast with rejected claim 75.

In contrast to the cited references, claim 75 is directed toward a disk drive that requires "an actuator arm; a data transducer; a load beam that is coupled to and supports the data transducer, the load beam having a thickness; a base plate that secures the transducer assembly to the actuator arm, the base plate having a thickness that is at least approximately three times the thickness of the load beam, the base plate including a flex section that allows the base plate to flex; and a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate." These features are not taught or suggested by the cited combination of references. Therefore, the combination of references does not support a rejection of claim 75, and the rejection should be withdrawn.

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IX. Conclusion

For the reasons advanced above, Appellants respectfully contend that each claim pending in the instant application is patentable, and should be allowed.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1141, and please credit any excess fees to such deposit account.

Respectfully submitted,

March 8, 2007
Date


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APPENDIX OF CLAIMS

6. A head stack assembly for a disk drive, the disk drive including a storage disk, the head stack assembly comprising:
- an actuator arm;
 - a coarse positioner that moves the actuator arm relative to the storage disk;
 - a transducer assembly including a load beam, a flexure secured to the load beam, and a data transducer secured to the flexure;
 - a separately formed base plate securing the transducer assembly to the actuator arm, the base plate including (i) one or more edges, (ii) a pair of flex sections that cantilever away from at least one of the edges, the flex sections allowing the base plate to flex, and (iii) a pair of spaced apart positioner cavities that are positioned between the flex sections; and
 - a fine positioner secured to the base plate, the fine positioner being positioned in the positioner cavities, the fine positioner moving a portion of the base plate relative to the actuator arm.
9. A disk drive comprising the head stack assembly of claim 6, and a storage disk.
10. The disk drive of claim 9 further comprising a control system that (i) directs current to the coarse positioner to move the actuator arm so that the data

transducer is positioned near the target track and (ii) directs current to the fine positioner to move the base plate so that the data transducer is positioned on the target track.

11. The disk drive of claim 9 further comprising a control system that (i) directs current to the coarse positioner to move the actuator arm so that the data transducer is on the target track, and (ii) directs current to the fine positioner to selectively move the base plate to maintain the data transducer on the target track.

13. The disk drive of claim 9 wherein the fine positioner is a piezoelectric motor.

22. A disk drive, comprising:

an actuator arm;

a transducer assembly including a load beam and a data transducer coupled to the load beam;

a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a flex section that allows the base plate to flex; and

a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate.

23. The disk drive of claim 22 wherein the fine positioner includes a pair of piezoelectric motors.

24. The disk drive of claim 23 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein at least one of the piezoelectric motors is positioned substantially between the flex sections.

25. The disk drive of claim 24 wherein each of the piezoelectric motors is positioned substantially between the flex sections.

26. The disk drive of claim 23 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein at least one of the flex sections is positioned substantially between the pair of piezoelectric motors.

27. The disk drive of claim 26 wherein each of the flex sections is positioned substantially between the pair of piezoelectric motors.

28. The disk drive of claim 23 wherein at least one of the piezoelectric motors is secured to the base plate under compression.

29. The disk drive of claim 23 wherein each of the piezoelectric motors is secured to the base plate under compression.

30. The disk drive of claim 23 wherein the base plate includes a plate mount that secures the base plate to the actuator arm, and wherein at least one of the piezoelectric motors is secured to the base plate substantially between the plate mount and the data transducer.

31. The disk drive of claim 30 wherein the piezoelectric motors are positioned substantially parallel to each other.

32. The disk drive of claim 23 wherein at least one of the piezoelectric motors includes a proximal end and a distal end, and wherein the proximal end and the distal end are the only portions of the at least one piezoelectric motor that contact the base plate.

33. The disk drive of claim 22 wherein the flex section is substantially U-shaped.

34. The disk drive of claim 22 wherein the flex section is substantially V-shaped.

35. The disk drive of claim 22 wherein the base plate includes a plate side, and wherein the flex section cantilevers away from the plate side.

36. The disk drive of claim 22 wherein the base plate includes a pair of plate sides and a pair of flex sections, and wherein each of the flex sections cantilevers away from a corresponding plate side.

37. A disk drive, comprising:

an actuator arm;

a transducer assembly including a load beam and a data transducer coupled to the load beam;

a separately formed base plate that secures the transducer assembly to the actuator arm; and

a first piezoelectric motor having a proximal end and a distal end, that ends being secured to the base plate so that the first piezoelectric motor is under compression, the first piezoelectric motor moving a portion of the base plate relative to the actuator arm.

38. The disk drive of claim 37 further comprising a controller that selectively directs current to the first piezoelectric motor, the first piezoelectric motor being under compression while the controller is not directing current to the first piezoelectric motor.

39. The disk drive of claim 37 wherein the proximal end and the distal end of the first piezoelectric motor are the only portions of the first piezoelectric motor that contact the base plate.

40. The disk drive of claim 39 further comprising a second piezoelectric motor and a second positioner cavity, and wherein the second piezoelectric motor has a proximal end and a distal end, the ends of the second piezoelectric motor being secured to the base plate so that the second piezoelectric motor is under compression.

41. The disk drive of claim 40 wherein the base plate includes a plate mount that secures the base plate to the actuator arm, and wherein at least one of the piezoelectric motors is secured to the base plate substantially between the plate mount and the data transducer.

42. The disk drive of claim 41 wherein the piezoelectric motors are substantially parallel to each other.

43. The disk drive of claim 40 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein the piezoelectric motors do not contact the flex sections.

44. The disk drive of claim 43 wherein at least one of the piezoelectric motors is positioned substantially between the flex sections.

45. The disk drive of claim 43 wherein at least one of the flex sections is positioned substantially between the piezoelectric motors.

46. The disk drive of claim 37 wherein the base plate includes a flex section that allows the base to flex, the flex section being substantially U-shaped.

47. The disk drive of claim 37 wherein the base plate includes a flex section that allows the base to flex, the flex section being substantially V-shaped.

48. The disk drive of claim 37 wherein the base plate includes (i) a plate side, and (ii) a flex section that allows the base plate to flex, the flex section cantilevering away from the plate side.

49. The disk drive of claim 37 wherein the base plate includes (i) a pair of plate sides, and (ii) a pair of flex sections that allow the base to flex, each of the flex sections cantilevering away from a corresponding plate side.

50. A disk drive, comprising:

an actuator arm;

a transducer assembly including a load beam and a data transducer coupled to the load beam;

a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a plate mount that secures the base plate to the actuator arm; and

a pair of piezoelectric motors that are each secured to the base plate between the plate mount and the data transducer, the piezoelectric motors being substantially parallel to each other, the piezoelectric motors moving a portion of the base plate relative to the actuator arm.

51. The disk drive of claim 50 wherein each piezoelectric motor includes a proximal end and a distal end, wherein the ends of the piezoelectric motors are the only portions of the piezoelectric motors that contact the base plate.

52. The disk drive of claim 50 wherein the ends of at least one of the piezoelectric motors are secured to the base plate so that the at least one piezoelectric motor is under compression.

53. The disk drive of claim 50 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein at least one of the piezoelectric motors does not contact either of the flex sections.

54. The disk drive of claim 53 wherein at least one piezoelectric motor is positioned between the flex sections.

55. The disk drive of claim 54 wherein at least one of the flex sections is substantially U-shaped.

56. The disk drive of claim 54 wherein the base plate includes a plate side, and wherein at least one of the flex sections cantilevers away from the plate side.

57. The disk drive of claim 53 wherein at least one of the flex sections is positioned substantially between the piezoelectric motors.

58. The disk drive of claim 57 wherein at least one of the flex sections is substantially V-shaped.

59. A disk drive comprising:

an actuator arm;

a transducer assembly including a load beam and a data transducer coupled to the load beam;

a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a positioner cavity that extends through the base plate; and

a fine positioner that is secured to the base plate so that the fine positioner is positioned over at least a portion of the positioner cavity, the fine positioner selectively flexing at least a portion of the base plate.

60. The disk drive of claim 59 wherein the fine positioner includes a pair of piezoelectric motors.

61. The disk drive of claim 60 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein at least one of the piezoelectric motors is positioned substantially between the flex sections.

62. The disk drive of claim 61 wherein each of the piezoelectric motors is positioned substantially between the flex sections.

63. The disk drive of claim 60 wherein the base plate includes a pair of flex sections that allow the base plate to flex, and wherein at least one of the flex sections is positioned substantially between the pair of piezoelectric motors.

64. The disk drive of claim 63 wherein each of the flex sections is positioned substantially between the pair of piezoelectric motors.

65. The disk drive of claim 60 wherein at least one of the piezoelectric motors is secured to the base plate under compression.

66. The disk drive of claim 60 wherein each of the piezoelectric motors is secured to the base plate under compression.

67. A method for increasing the positioning accuracy of a disk drive, the method comprising the steps of:

securing a transducer assembly to an actuator arm with a separately formed base plate having a flex section that flexes;

securing a fine positioner to the base plate so that the fine positioner is not in contact with the flex section; and

flexing the flex section with the fine positioner to cause at least a portion of the base plate to move relative to the actuator arm.

68. The method of claim 67 wherein the step of securing the fine positioner includes using a piezoelectric motor as the fine positioner.

69. The method of claim 67 wherein the step of securing the transducer assembly includes providing the base plate having a pair of spaced apart flex sections that flex, and wherein the step of flexing the flex section includes moving the fine positioner to flex each of the flex sections to cause at least a portion of the base plate to move relative to the actuator arm.

70. The method of claim 69 wherein the step of securing the fine positioner includes using a pair of spaced apart piezoelectric motors as the fine positioner and positioning the piezoelectric motors substantially between the flex sections.

71. The method of claim 70 wherein the step of securing the transducer assembly includes providing the base plate having a plate side, and cantilevering the flex section away from the plate side.

72. The method of claim 69 wherein the step of securing the fine positioner includes using a pair of piezoelectric motors as the fine positioner and positioning the flex sections substantially between the piezoelectric motors.

73. The method of claim 67 wherein the step of securing the fine positioner includes securing the fine positioner to the base plate so that the fine positioner is under compression.

74. The method of claim 67 wherein the step of securing the transducer assembly includes using a plate mount of the base plate secure the transducer assembly to the actuator arm, and wherein the step of securing the fine positioner includes (i) positioning the fine positioner to the base plate substantially between the plate mount and the data transducer, and (ii) providing

a pair of substantially parallel, spaced apart piezoelectric motors as the fine positioner.

75. A disk drive, comprising:

an actuator arm;

a data transducer;

a load beam that is coupled to and supports the data transducer, the load beam having a thickness;

a base plate that secures the load beam to the actuator arm, the base plate having a thickness that is at least approximately three times the thickness of the load beam, the base plate including a flex section that allows the base plate to flex; and

a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate.

APPENDIX OF EVIDENCE

The Appellant has attached herewith the following evidence which has been relied upon by the Appellant during prosecution in this matter, and for purposes of the instant appeal:

1. Declaration of Stephen P. Williams pursuant to 37 C.F.R. 1.131, including Exhibits thereto.

The above evidence was filed by the Appellant during prosecution on September 14, 2004 (received by the Patent Office on September 17, 2004), and is believed to have been acknowledged and entered in the record by the examiner as indicated in Office Action dated February 7, 2005, at page 2 of Paper No. 8, under the heading "Response to Amendment".

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

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In re application of:	Williams, et al.)
)
Serial No:	09/768,975) Art Unit
) 2653
Filed:	January 23, 2001)
)
For:	A DUAL STAGE, HEAD STACK ASSEMBLY FOR A DISK DRIVE)
)
Examiner:	Blouin, Mark)
)
Attorney Docket:	Q01-1000-US1 / 11198.52)

DECLARATION OF STEPHEN P. WILLIAMS PURSUANT TO 37 C.F.R. 1.131

I, Stephen P. Williams, declare as follows:

1. At all relevant times herein, I was employed as a Design Engineer by Quantum Corporation ("Quantum") and/or Maxtor Corporation ("Maxtor"). On information and belief, the disk drive division of Quantum was acquired by Maxtor in approximately April 2001, after which point I began to work for Maxtor. I have knowledge of the facts contained herein, and if called as a witness, could and would competently testify thereto.

2. ~~On information and belief~~, Albert Hartman, Thomas Tacklind and I are co-inventors of the present invention that is encompassed within U.S. Patent Application Serial No. 09/768,975 (the "Present Application"). At least prior to August 29, 2000, I was personally on the engineering team that conceived of in the United States, and further developed various embodiments of the concepts included in the Present Application, including construction of a prototype, prior to August 29, 2000.

3. Among the concepts which the co-inventors and I conceived of and participated in constructing prior to August 29, 2000, are one or more embodiments of:

a. A head stack assembly for a disk drive that includes an actuator arm; a coarse positioner that moves the actuator arm relative to the storage disk; a transducer assembly including a load beam, a flexure secured to the load beam, and a data transducer secured to the flexure; a separately formed base plate securing the transducer assembly to the actuator arm, the base plate including (i) one or more edges, (ii) a pair of flex sections that cantilever away from at least one of the edges, the flex sections allowing the base plate to flex, and (iii) a pair of spaced apart positioner cavities that are positioned between the flex sections; and a fine positioner secured to the base plate, the fine positioner being positioned in the positioner cavities, the fine positioner moving a portion of the base plate relative to the actuator arm;

b. A disk drive including an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a flex section that allows the base plate to flex; and a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate;

c. A disk drive including an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm; and a first piezoelectric motor having a proximal end and a distal end, ~~that ends~~ being secured to the base plate so that the first piezoelectric motor is under compression, the first piezoelectric motor moving a portion of the base plate relative to the actuator arm;

d. A disk drive including an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a plate mount that secures the base plate to the actuator arm; and a pair of piezoelectric motors that are each secured to the base plate between the plate mount and the data transducer, the

piezoelectric motors being substantially parallel to each other, the piezoelectric motors moving a portion of the base plate relative to the actuator arm;

e. A disk drive including an actuator arm; a transducer assembly including a load beam and a data transducer coupled to the load beam; a separately formed base plate that secures the transducer assembly to the actuator arm, the base plate including a positioner cavity that extends through the base plate; and a fine positioner that is secured to the base plate so that the fine positioner is positioned over at least a portion of the positioner cavity, the fine positioner selectively flexing at least a portion of the base plate;

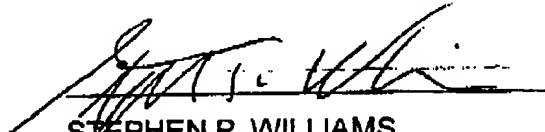
f. A method for increasing the positioning accuracy of a disk drive including the steps of securing a transducer assembly to an actuator arm with a separately formed base plate having a flex section that flexes; securing a fine positioner to the base plate so that the fine positioner is not in contact with the flex section; and flexing the flex section with the fine positioner to cause at least a portion of the base plate to move relative to the actuator arm; and

g. A disk drive including an actuator arm; a data transducer; a load beam that is coupled to and supports the data transducer, the load beam having a thickness; a base plate that secures the load beam to the actuator arm, the base plate having a thickness that is at least approximately three times the thickness of the load beam, the base plate including a flex section that allows the base plate to flex; and a fine positioner that is secured to the base plate so that the fine positioner does not contact the flex section, the fine positioner selectively flexing at least a portion of the base plate.

4. As proof of the construction of these embodiments prior to August 29, 2000, attached hereto as Exhibit "A" are true and correct copies of four enlarged photographs of one or more prototypes of at least one embodiment of the relevant portion of the invention, which were constructed on behalf of Quantum prior to August 29, 2000.

I declare that the facts set forth in this declaration are true; and that all statements made on my own knowledge are true and all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issuing therefrom.

Executed on this 9th day of September, 2004, in MILPITAS, California.



STEPHEN P. WILLIAMS

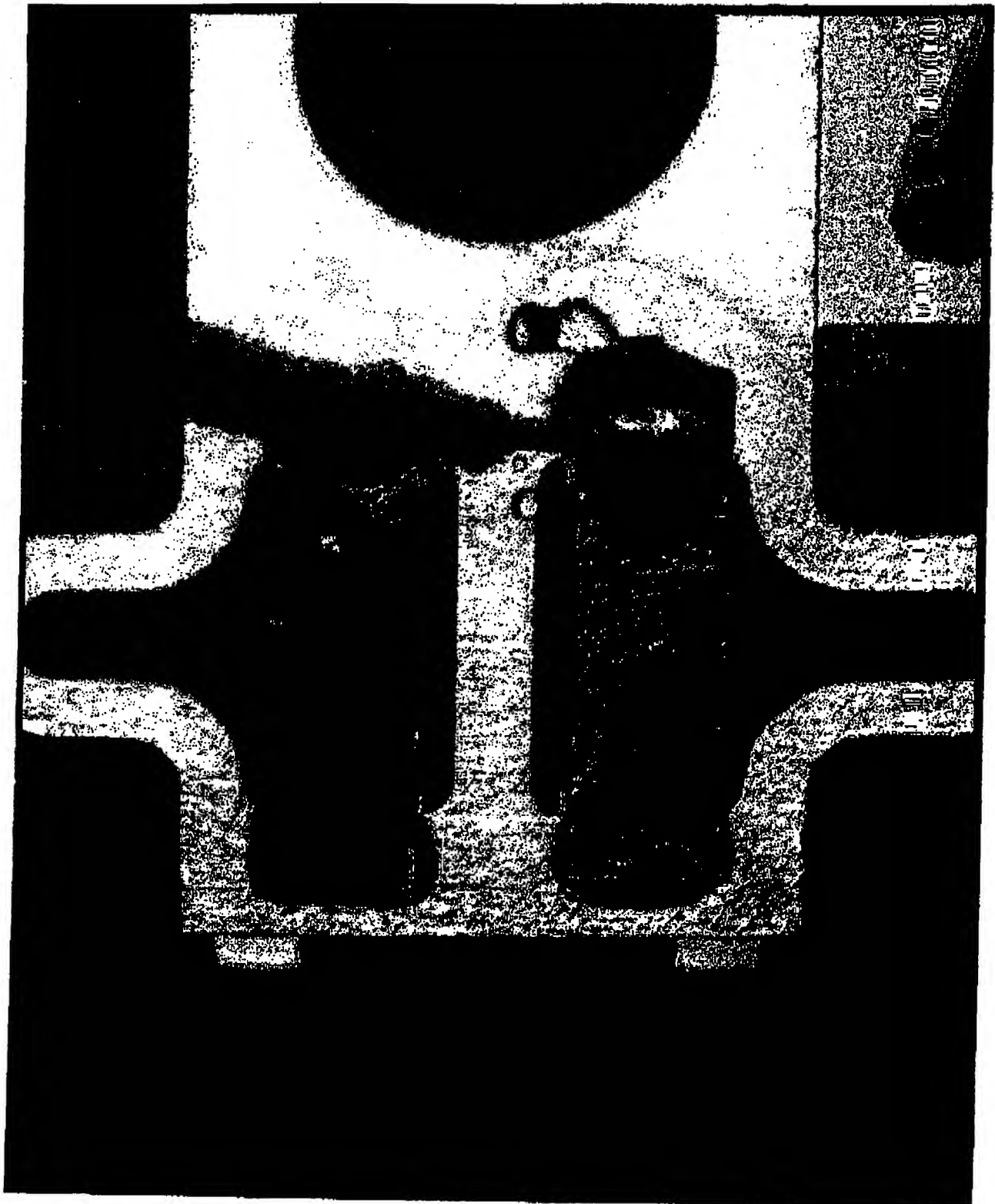
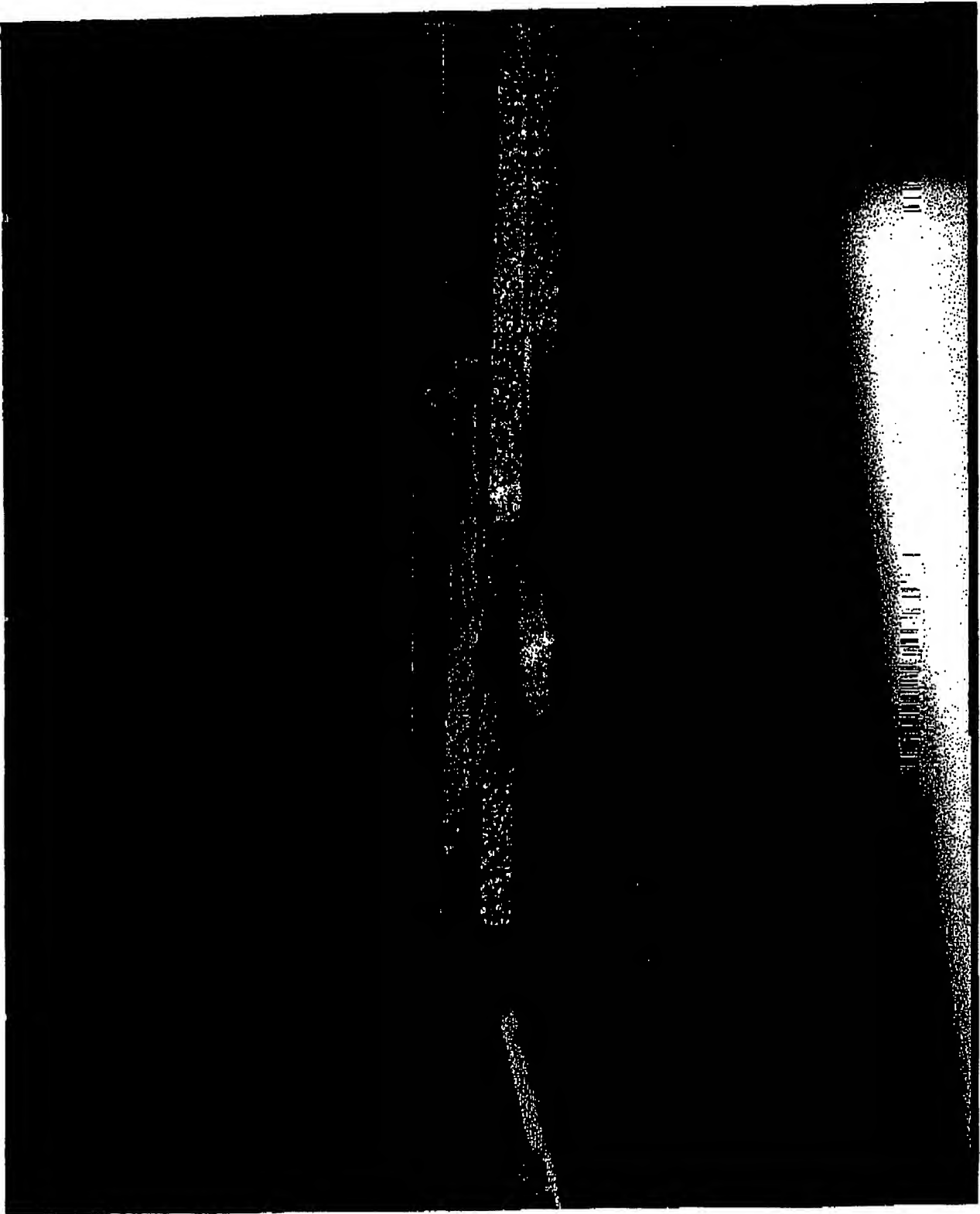
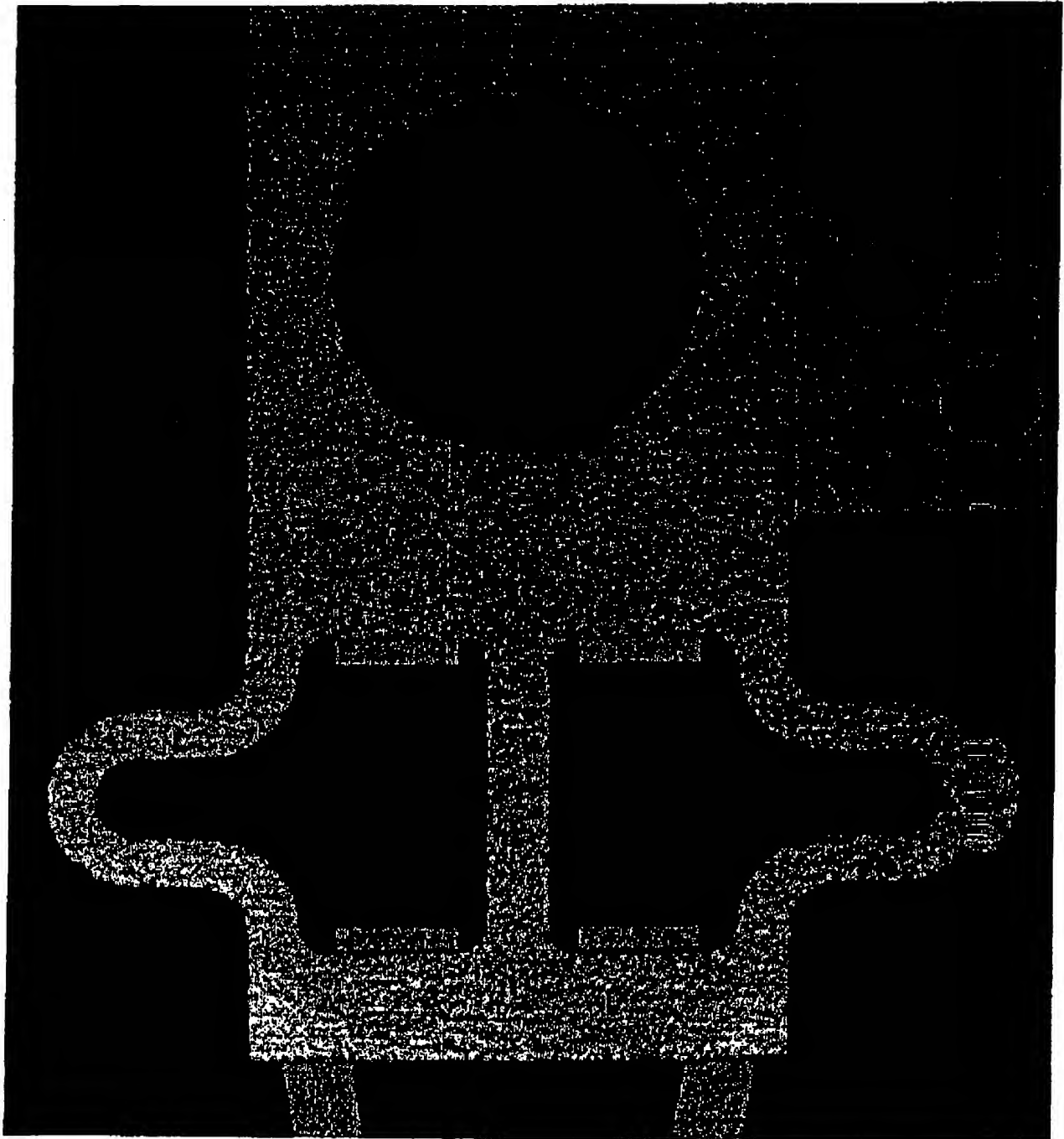
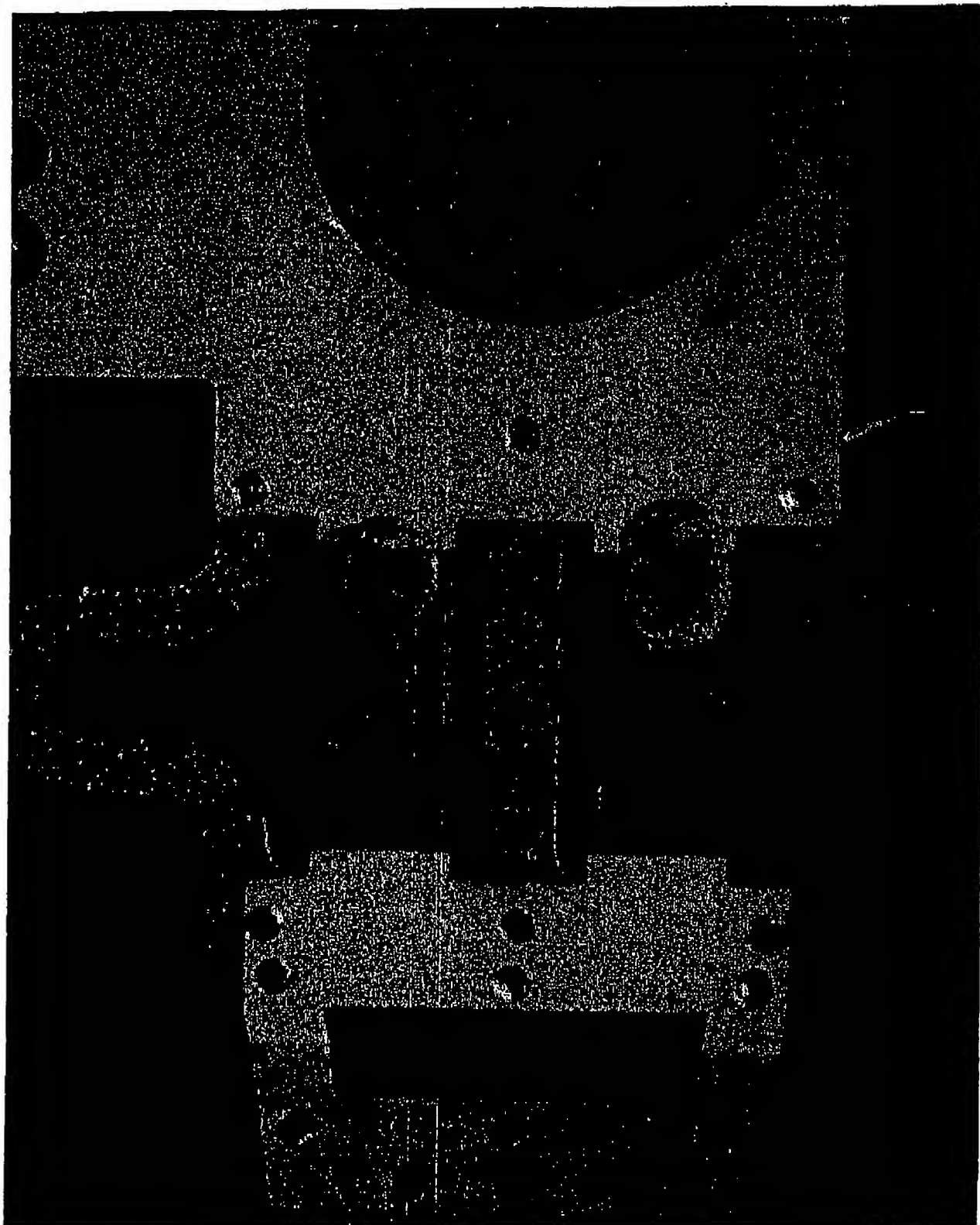


EXHIBIT "A"







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APPENDIX OF RELATED PROCEEDINGS

Because no related proceedings have occurred, no decisions have been rendered by a court or the Board relative to this matter.